Remote Science Software Integration and Test
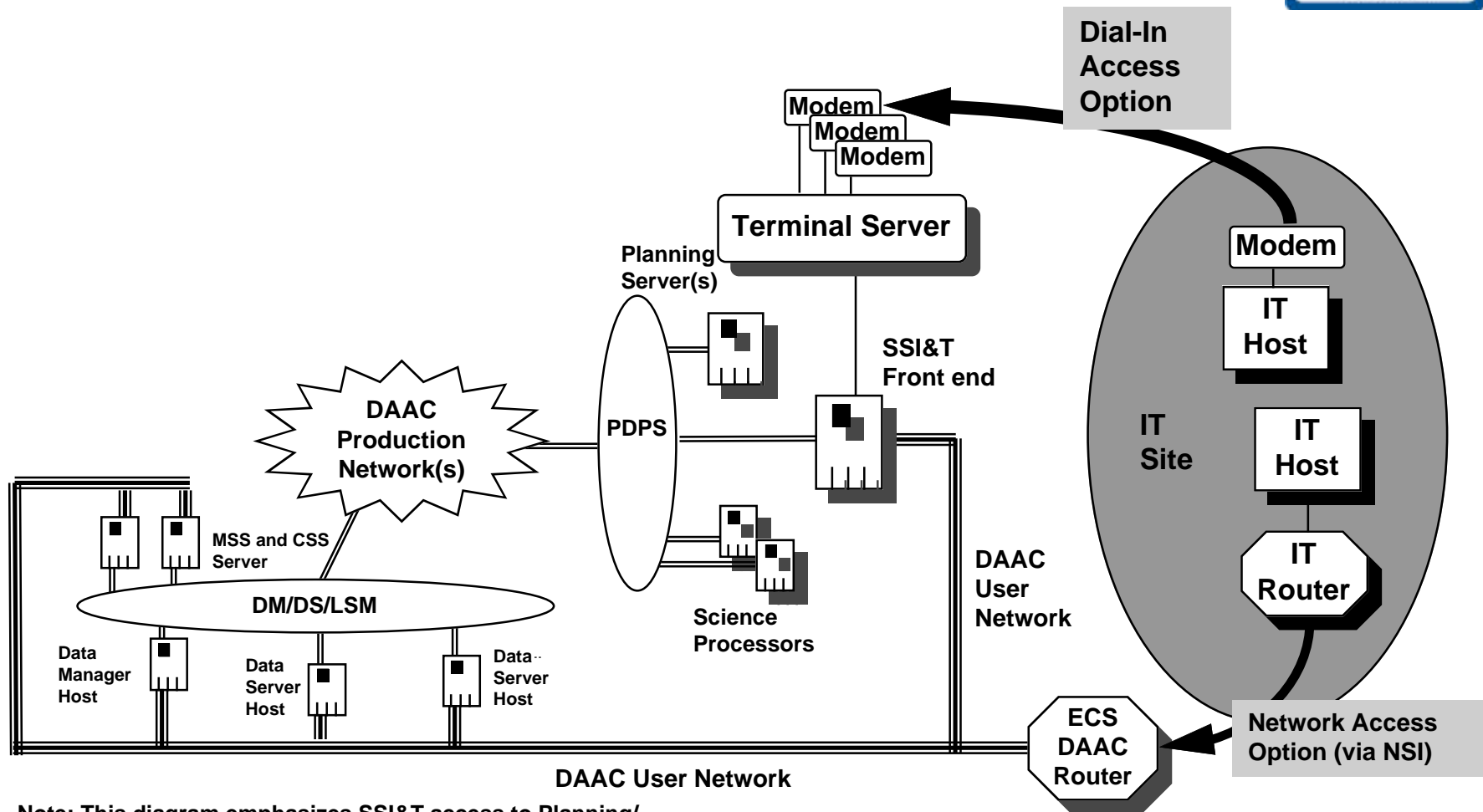
Larry Klein

19 January 1996

Remote Science Software Integration and Test: Overview

- **Provides tools which enable integration of science software into the ECS production system.**

- **Consists of the SDP toolkit with DAAC extensions, planning and data processing user interfaces, test and execution analysis tools.**

- **Integration will be done in the production system environment, i.e. will use same software and hardware components as the operational system. However, production and test components are separable and configurable.**

- **Local (DAAC) and remote (SCF) access will be available. Intention of remote access is to add efficiency to I&T process; e.g. prepare delivery package, reduce travel time.**

Remote Access: Network Architecture

Dial-In Access Option

Modem
Modem
Modem

Terminal Server

Planning Server(s)

SSI&T Front end

PDPS

DAAC Production Network(s)

Modem

IT Host

IT Site

IT Host

IT Router

MSS and CSS Server

DM/DS/LSM

Science Processors

DAAC User Network

Data Manager Host

Data Server Host

Data Server Host

ECS DAAC Router

Network Access Option (via NSI)

DAAC User Network

Note: This diagram emphasizes SSI&T access to Planning/ Scheduling hosts, so some subsystems and DAAC networks are not shown for clarity.

Remote Access Methods

SCF Configuration #1: Dial-up access from SCF to DAAC.

- **Provides X11 access over switched circuits.**
- **Break-in potential is very remote.**
- **Requires 28.8 kbs modems and a terminal server.**

SCF Configuration #2: Firewall at SCF

- **Dedicated LAN at SCF behind a router.**
- **Provides X11 access over router; prohibits other X11 connections.**
- **Communication is over open NSI / internet circuits.**

Remote Science Software
I&T Capabilities - Policy Neutral

Ir1

- Ingest software and test data from SCF and verify contents.
- Compile and build executables.
- Populate production system DB with process control information.
- Test execution of single PGEs and chains of PGEs.
- Collect resource utilization and performance statistics.
- Examine test run outputs and compare with SCF results.

Release A adds

- Creation and execution of production requests via planning system.

Release B adds

- Tools to access and modify instrument team delivery package (SSAP).
- Tools to insert Q/A and metadata; edit science product data.
- Enter PGE activation rules.
- PGE Log browsing capability.
- Mode management.

Remote Science Software Integration and Test: Issues

- **Is external security accounted for?**

Yes, this is handled by the design of the remote access method.

- **Will the local SSI&T operator have different capabilities than the remote user?**

This is a DAAC / instrument team policy consideration.

- **What is the extent of remote SSI&T? Is all test data pre-staged or is data server access necessary? Is SSI&T end-to-end testing (production requests) or 'simple' PGE strings testing?**

This is a DAAC / instrument team policy consideration.

- **Can the DAAC operator configure HW and SW, separating production system and test components?**

Yes, test and production modes are configured in Resource Planning . Mode management is accomplished as a function of time by production planner and scripts run via HP OpenView.

Control of DAAC Configuration

- **Resource Planning:** Operator determines what HW and SW components are available to test and production modes. Multiple modes are possible, e.g. MODIS has different test requirements than LIS. Successive refinements in capacity are based on SSI&T results.

- **Configuration:** Two instantiations of the Production Planner and Scheduler will exist; test and production, each with a different HW configuration. Since a machine can be run in test or production mode, all required SW must be installed. The data server will be configured so that production metadata and data are not over-written.

- **Configuration vs. Time:** Mode Management in HP OpenView - The configuration will change as a function of time according to the testing schedule. The operator will initiate a script, which establishes test and production strings according to the plan. e.g. run MISR test mode from 2:00 p.m. to 10:00 p.m.

- **Control at Application Level:** COTS, custom tools are user access controllable at GUI level or by licensing.

Remote Science Software Integration and Test

Assumptions about remote access procedures:

- The remote user will file a candidate plan, detailing resource requirements.

- The remote user will follow procedures, such as CM, or risk failure of test.

- The DAAC will allocate time slots for remote access.

- The remote user will establish and activate the plan.

- The DAAC will have over-ride capability.

Remote Science Software Integration and Test: Access

Analysis Tools

- Configuration Management Tool - ClearCase.

- Documentation Viewing Tools - Ghostview, Adobe Acrobat, Web browser.

- Standards Checking Tools - FORCHECK, Process Control File Checker, Prohibited Function Checker.

- Code Analysis Tools - CaseVision and SPARCWorks.

- Profiling Tools - CaseVision

- Data Visualization Tools - IDL, EOSView

- File Comparison Tools - ASCII File Compare, Binary File Compare, HDF File Compare.

- PGE Log Browser - View database entries.

- **Risk:** Little, other than resource contention due to number of users

- **Control mechanism:** Standard UNIX mechanisms, licensing, SSI&T manager user authorization.

Remote Science Software Integration and Test: Access (cont.)

Science Software Application Package

View and Add/Update SSAP:

- **Risk:** Changes made without DAAC awareness.
- **Control mechanism:** User authorization at application level; require instrument team to use DAAC CM.

Display/Insert metadata; Add/Edit Science Product; Define New Data Type:

- **Risk:** Changes made without DAAC awareness, databases populated with extraneous entries.
- **Control mechanism:** User authorization at application level; require instrument team to use DAAC CM. Data base partitioning.

Remote Science Software **Integration** and Test: Access (cont.)

Production System

PGE Registration Tool - Register PGE in PDPS database, edit activation rules.

- **Risk:** Loss of control of database.
- **Control mechanism:** User authorization in registration GUI, data base partitioning into production and test, shared data.

Create and Execute Production requests - Production Request Editor, Production Planning Workbench (test instantiation), Production Scheduler (test instantiation).

- **Risk:** Load on resources, contention with other planned tests.
- **Control mechanism:** User authorization in production request GUI, control of test configuration of HW and SW through mode management.